

SERVICE MANUAL

TIME BASE CORRECTOR **FA-145**

(1ST EDITION)

Contents

| | |
|--|----|
| 1. Prior to Starting | 1 |
| 1-1. General | 1 |
| 1-2. Test Equipment | 1 |
| 2. Test Equipment Connection | 2 |
| 3. Before Adjustment..... | 3 |
| 4. Adjustments / Alignments | 4 |
| 4-1. Genlock Adjustment | 4 |
| 4-2. Video Input Output Adjustment | 5 |
| 4-3. Final Check (UNITY Settings) | 7 |
| 4-4. MAIN CARD Settings..... | 8 |
| 5. Block Diagram | 10 |
| 6. Circuit Diagram | |
| 7. Parts List | |

1. Prior to Starting

1-1. General

This service manual is intended for use only by qualified service engineers who are familiar with FOR.A products. Maintenance procedures and/or adjustments explained herein should not be attempted by unqualified personnel.

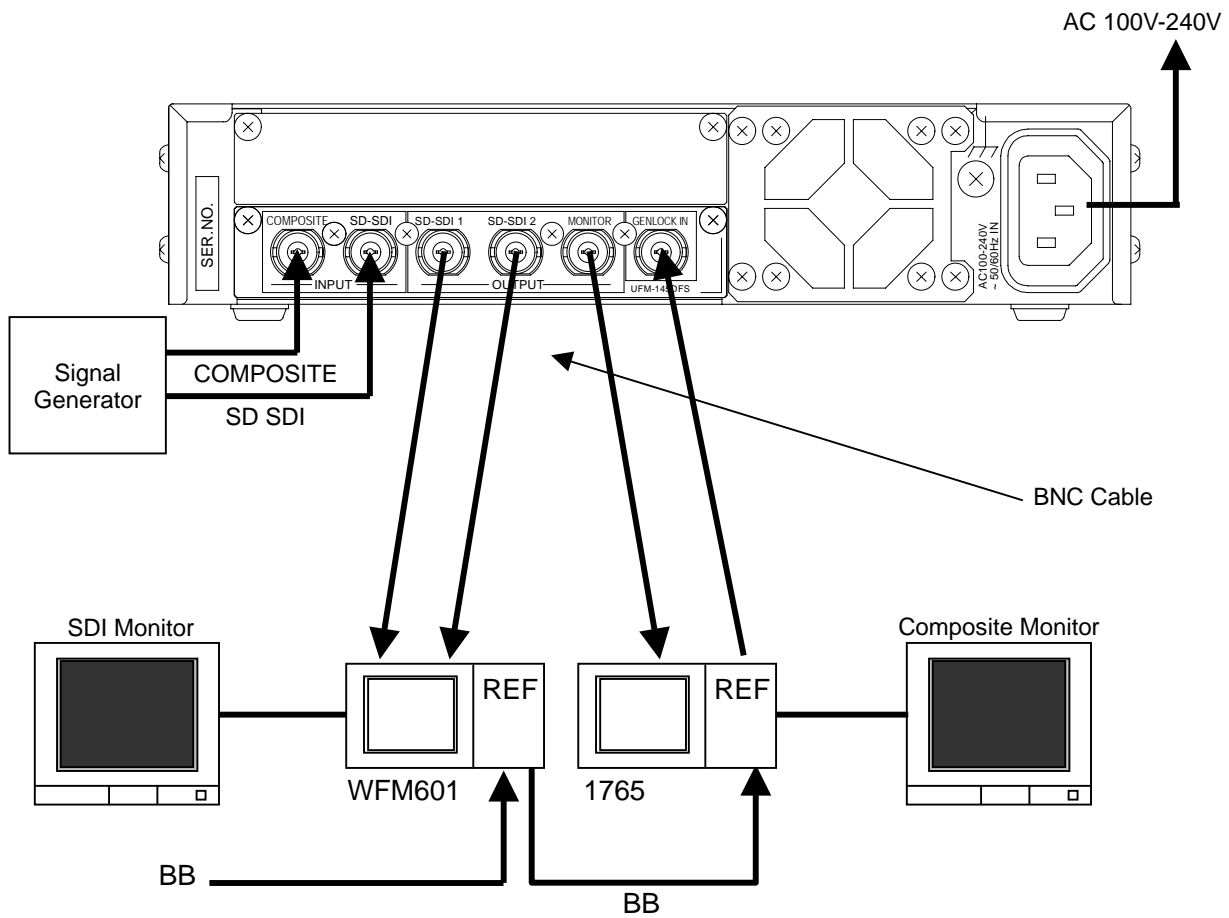
1-2. Test Equipment

FA-145 units should be configured as shown in sec. 2 "Test Equipment Connection" prior to performing adjustments using the test equipment listed below. (Or equipment having equivalent or better capability.)

| | Equipment | Type |
|---|---------------------------------|--|
| 1 | Composite monitor | For analog signal |
| 2 | SDI monitor | For digital signal (SD SDI) |
| 3 | Black Burst signal | Reference signal |
| 4 | Test signal generator | The signal generator should be directly connected to the unit without using an amplifier. Composite (NTSC, PAL), D1 (NTSC, PAL) |
| 5 | Oscilloscope | 100MHz or higher |
| 6 | Waveform monitor (Tektronix) | 1765 |
| 7 | Waveform monitor (Tektronix) | WFM601 |

2. Test Equipment Connection

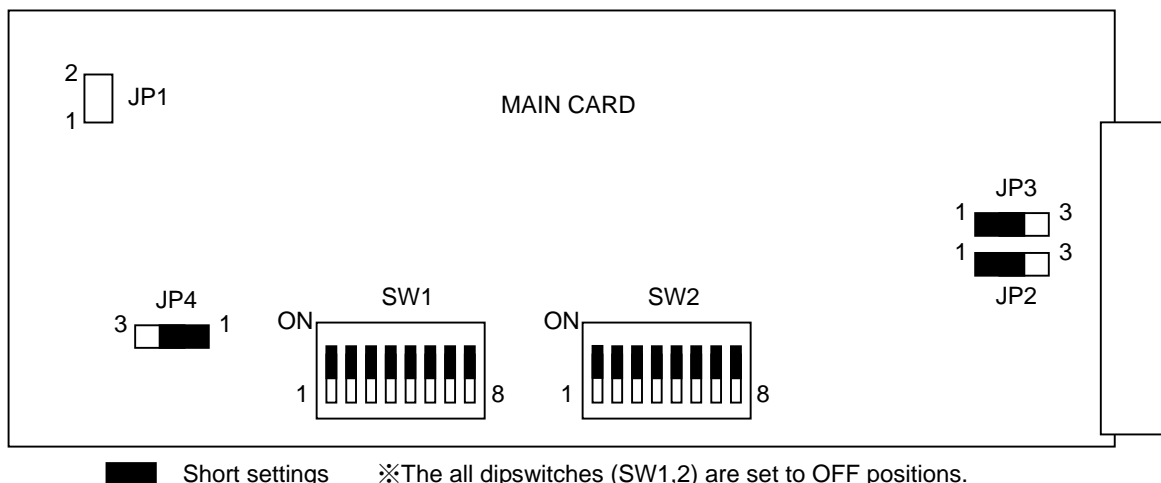
A connection example of FA-145 for alignment and adjustment is given below.



3. Before Adjustment

Dipswitch and jumper operational settings are made at the factory and should not need to be changed during normal operation. If changes have to be made during the course of these adjustments, refer to the figure below and sec. 4-4 "MAIN CARD Settings" to remake original settings.

| Switches | | Settings |
|----------|-----|-----------|
| JP1 | | Open |
| JP2 | | 1-2 short |
| JP3 | | 1-2 short |
| JP4 | | 1-2 short |
| SW1 | 1-8 | All OFF |
| SW2 | 1-8 | All OFF |



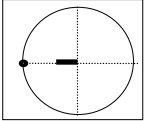
4. Adjustments / Alignments

IMPORTANT



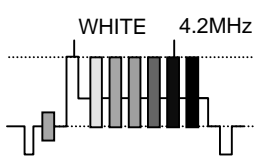
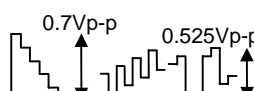
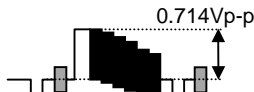

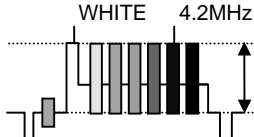

Warm up your unit for at least 30 minutes before making following adjustments.

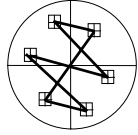
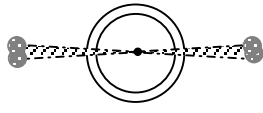
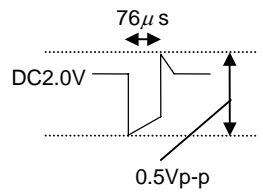
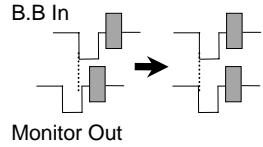
When performing following adjustments, all switches on the front panel should be set to UNITY.

4-1. Genlock Adjustment

| No | Item | ①Input signal (Composite) ②Input signal (SDI) ③Genlock signal ④Equipment | Test point | Adjust | Procedure | Waveform |
|----|------------------------|---|-------------|-----------|---|--|
| 1 | Input | ①75% color bars ②None ③BB ④Monitor | | | Verify that INPUT and GENLOCK LED on the front are lit. | Genlock LED goes to lit. |
| 2 | Free-running frequency | ①75% color bars ②None ③None ④1765 | MONITOR OUT | VR18 (R5) | Input external reference signal to 1765. While FA-145 is free-running, adjust signal rotation speed to minimum. (5 rotations per sec. or less.) |  |
| | Genlock | ①75% color bars ②None ③BB ④1765 | MONITOR OUT | | Input BB and verify that the signal is locked. | |


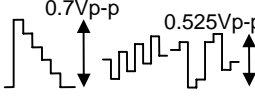

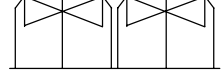
4-2. Video Input Output Adjustment

| No | Item | ①Input signal (Composite) ②Input signal (SDI) ③Genlock signal ④Equipment | Test point | Adjust | Procedure | Waveform |
|----|---|---|--------------|-----------|---|---|
| 3 | SDI input/output | ①None ②75% color bars ③BB ④WFM601 | SDI OUT 1, 2 | | Verify that SDI_OUT1 and SDI_OUT2 are both set to: Y: 700mV B-Y, R-Y: 525mV |  |
| | SDI input/composite output level | ①None ②75% color bars ③BB ④1765 | MONITOR OUT | VR19 (T5) | Verify that the output signal of MONITOR OUT is set to 714mV. |  |
| | SDI input/composite output frequency response | ①None ②75% multiburst ③BB ④1765 | MONITOR OUT | VC3 (T5) | Set SW1-7 (B&W) to ON, adjust so that 4.2MHz and WHITE of MONITOR OUT have the same amplitude levels (within $\pm 5\%$). *After the adjustment, set SW1-7 back to OFF |  |
| 4 | Composite input/SDI output level | ①75% color bars ②None ③BB ④WFM601 | SDI OUT 1, 2 | VR5 (D3) | Verify that SDI_OUT1 and SDI_OUT2 are both set to: Y: 700mV B-Y, R-Y: 525mV |  |
| | Composite input/composite output level | ①75% color bars ②None ③BB ④1765 | MONITOR OUT | VR6 (F2) | Verify that the output signal of MONITOR OUT is set to 714mV. If not, use VR6 to adjust. |  |
| | Composite input/SDI output frequency response | ①75% multiburst ②None ③BB ④WFM601 | SDI OUT 1, 2 | | Verify that SDI_OUT1 and SDI_OUT2 are both flat. |  |
| | Composite input/composite output frequency response | ①75% multiburst ②None ③BB ④1765 | MONITOR OUT | | Verify that 4.2MHz and WHITE of MONITOR OUT have the same amplitude levels (within $\pm 5\%$). |  |
| 5 | SC lock | ①75% color bars ②None ③BB ④Oscilloscope | TP26 (F4) | VR20 (D3) | Adjust so that amplitude of TP26 is minimized as a straight line. (Set VD of input signal as a trigger.) |  |

| No | Item | ①Input signal (Composite) ②Input signal (SDI) ③Genlock signal ④Equipment | Test point | Adjust | Procedure | Waveform |
|----|-----------------|---|----------------------|--|---|---|
| 6 | Chroma phase | ①75% color bars ②None ③BB ④WFM601 | SDI OUT 1, 2 | Dipswitch SW2-8 (D3) Toggle Switch SW4 (D3) | Set SW2-8 to ON. Adjust the toggle switch SW4 so that the chrominance vectors are located in each 4-box 田 mark. * After the adjustment, set SW2-8 back to OFF. |  |
| | | | | VR10 (D1) | If there is chroma jitter, adjust jitter to minimum using VR10. | |
| 7 | H jitter (HVCO) | ①75% multiburst ②None ③BB ④1765 | MONITOR OUT | VR20 (D3) | If jitter level is high, use VR20 to adjust jitter to minimum. In that case adjust the chroma phase again so that the vectors are located in each 4-box 田 mark. |  |
| 8 | VTR (HVCO) | ①VTR ②None ③BB ④Oscilloscope | TP3 (F2) TP8 (D1) | VR9 (D1) VR11 (D1) | Connect TP3 (trigger) to CH1 and TP8 to CH2 of oscilloscope to observe TP8 signal with V-rate. Use VR9 and VR11 to adjust the waveform of TP8 as shown in the figure at right. |  |
| 9 | H phase | ①75% color bars ②None ③BB ④Oscilloscope | MONITOR OUT | Toggle Switch SW4 (D3) | Zoom to enlarge image around where the reference signal falls. Align H phase using the toggle switch on the front panel. (Set HD of reference signal as a trigger.) |  |

4-3. Final Check (UNITY Settings)

*The settings bellow should be verified on both NTSC and PAL signals.

| No | Item | ①Input signal (Composite) ②Input signal (SDI) ③Genlock signal ④Equipment | Test point | Adjust | Procedure | Waveform |
|----|-----------------------------|---|--------------|--------------|--|---|
| 10 | Level | ①75% color bars (NTSC, PAL) ②None ③BB ④1765 | MONITOR OUT | | Verify that the output signal of MONITOR OUT has the same amplitude level (within $\pm 1\%$) as the input signal. | Same level as input signal  |
| | | ①None ②75% color bars (NTSC, PAL) ③BB ④WFM601 | SDI OUT 1, 2 | | Verify that the output signals of both SDI_OUT1 and SDI_OUT2 have the same amplitude levels (within $\pm 1\%$) as the input signal. |  |
| | Y/C Delay (Composite input) | ①2T pulse (NTSC, PAL) ②None ③BB ④1765 | MONITOR OUT | | Verify that the signal is symmetrical as shown in the figure at right. |  |
| | Y/C Delay (SDI input) | ①None ②Bowtie (NTSC, PAL) ③BB ④WFM601 | SDI OUT 1, 2 | | Verify that the signal is symmetrical as shown in the figure at right. |  |
| | UNITY / OPERATE | ①75% color bars (NTSC, PAL) ②None ③BB ④1765 | MONITOR OUT | Front Volume | Adjust the front volume to make the UNITY and OPERATE settings (VIDEO LEVEL, CHROMA LEVEL, SET UP, CHROMA PHASE) consistent while switching UNITY and OPERATE by the toggle switch on the front panel. | |

4-4. MAIN CARD Settings

Jumper and dipswitch settings on the Main card are factory made as below. They should not need to be changed. Simply verify settings are as shown.

◆ Dipswitch SW1 (card address:H1)

| Pin No. | Function | Setting | | |
|---------|--------------------|-----------|-------|-----------------|
| | | ON | OFF | Factory Default |
| 1 | FACTORY SET | --- | --- | OFF |
| 2 | TEST SIGNAL | COLOR BAR | OFF | OFF |
| 3 | FREEZE MODE SELECT | Field | Frame | OFF |
| 4 | FIELD SELECT | EVEN | ODD | OFF |
| 5 | AUTO FREEZE | ON | OFF | OFF |
| 6 | FORCED FIELD | ON | OFF | OFF |
| 7 | B/W | ON | OFF | OFF |
| 8 | VITS | ON | OFF | OFF |

◆ Dipswitch SW2 (card address:J1)

| Pin No. | Function | Setting | | |
|---------|--------------|----------|---------|-----------------|
| | | ON | OFF | Factory Default |
| 1 | REMOTE | REMOTE | LOCAL | OFF |
| 2 | SET UP | ON | OFF | OFF |
| 3 | SYNCHRO MODE | LINE | FRAME | OFF |
| 4 | EDH | ON | OFF | OFF |
| 5 | REF SEL MODE | MANUAL | AUTO | OFF |
| 6 | REF SEL | REAR BNC | SYSTEM | OFF |
| 7 | NTSC/PAL | GENLOCK | INPUT | OFF |
| 8 | ADJUSTMENT | ADJUST | OPERATE | OFF |

◆ Jumper Settings

| JP No. | Card Address | Function | Settings | | |
|--------|--------------|-------------------------------------|----------------------------|--------------------------|----------------------------|
| | | | Setting 1 | Setting 2 | Factory Default |
| JP1 | B6 | Resets CPU | --- | --- | Open |
| JP2 | T4 | Selects MONITOR OUT or GENLOCK_THRU | MONITOR OUT (1-2 short) | GENLOCK_THRU (2-3 short) | MONITOR OUT (1-2 short) |
| JP3 | T4 | Sets GENLOCK termination | 75Ω terminated (1-2 short) | No termination (open) | 75Ω terminated (1-2 short) |
| JP4 | C2 | Adjusts input signal sync | Default (1-2 short) | Variable (2-3 short) | Default (1-2 short) |

◆ Switches and volumes on the front panel

| | | Factory Default |
|-----------------|---------------|-----------------|
| PROCESS CONTROL | Toggle switch | UNITY |
| | VIDEO LEVEL | Center |
| | CHROMA LEVEL | Center |
| | SETUP/BLACK | Center |
| | CHROMA PHASE | Center |
| H PHASE | Toggle switch | Center |
| INPUT SELECT | COMPOSITE/D1 | COMPOSITE |
| FREEZE | ON/OFF | OFF |

5. Block Diagram

